The nitrogen fixed for alfalfa lowers the amount of nitrogen that farmers need to apply to the following crops. Currently, the Utah Fertilizer Guide gives two calculations to find nitrogen application recommendations. The first uses a blanket credit of 112 kg N ha⁻¹. The second calculation uses soil test nitrogen (STN) results.

**Objective**

1) To determine how much nitrogen is required by first and second year corn to maximize dry matter yield, forage quality and farm profit.
2) To compare the economic optimum nitrogen rate (EONR) to the recommended nitrogen rates to see if these recommendations should be reevaluated.

**Materials and Methods**

**Study Sites**: 36 sites have been studied from 2014 to 2017 using a randomized complete block. 27 sites were first year corn, and 9 were second year corn. N application had 4 treatments and 4 reps. 3 soil cores were taken to 90 cm.

**Results and Discussion**

1) **First Year Corn**
   - Nitrate-N application recommendations determined using a quadratic + plateau curve.
   - The blanket blanket provides a starting point for nitrogen application recommendations.

2) **Second Year Corn**
   - Nitrogen application recommendations determined using a quadratic + plateau curve.

**Conclusions**

1) After alfalfa, first year corn fields had, on average, 156.9 kg nitrate N ha⁻¹ and 8,022 kg TN ha⁻¹ in the top 90 cm. Second year fields had 145.3 kg nitrate ha⁻¹ and 7,770 kg TN ha⁻¹ to the same depth. This potential nitrogen credit caused first and second year corn to show very little response to added nitrogen. However, if irrigation is improperly managed the nitrogen responses could be much greater, see site 16.

2) The comparison between the recommended nitrogen application rates and the EONR suggests that our current recommendations, for both first and second year corn, may be too high.

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